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AF 1617

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	) Atty. Dkt. No. 00.05.12.1
Steven B. Laramay and	) Art Unit: 1617
John H. Schneider	)
Serial No. 09/770,931	) Examiner: Gina C. Yu
Filing Date: January 26, 2001	)
Title:	) Duncan, Oklahoma 73534
	)
ENCAPSULATED COMPOSITIONS	) Date: November 5, 2003

RESPONSE TO SECOND FINAL REJECTION

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

The following remarks are presented in response to the Second Final Rejection mailed September 23, 2003.

Claim Status

Claims 16-30 and 32-35 are pending. Claims 29, 32 and 33 have been withdrawn from consideration. Accordingly, claims 16-28, 30, 34 and 35 stand rejected. The claim pattern is attached hereto as Enclosure A.

Invention

This invention is an article of manufacture comprised of a capsule and a chemical composition. The capsule comprises a membrane wall surrounding a hollow interior. The composition is enclosed in the hollow interior of the capsule. The membrane wall is permeable to water and aqueous solutions, but is not soluble in aqueous liquids. The composition enclosed in the hollow interior of the capsule is, preferably, a solid, water-soluble chemical. The composition is not reactive with, soluble in nor a solvent for the membrane wall.

In use, the exterior surface of the capsule is placed in contact with a liquid containing water. The membrane wall is not reactive with, soluble in nor a solvent for liquid in contact with the exterior surface of the capsule. The water diffuses through the membrane wall, contacts and dissolves the composition in the interior of the capsule. The composition, now in aqueous solution, then diffuses through the membrane wall to the exterior of the capsule. During the diffusion, which can extend over a period of time, the capsule remains intact. It does not burst. The transfer of the composition from the interior of the capsule through the membrane wall to the exterior of the capsule is gradual in nature. The transfer is not sudden in nature.

ART REJECTIONS

The rejection of claims 16-28, 30, 34 and 35 under 35 U.S.C. 103(a) as being obvious over Mitchell et al (US 5,741,433) in view of Vijayendran et al (US 5,173,526) is traversed for the following reasons.

The previous Office Action mailed May 12, 2003, rejected claims 16, 17 and 21 under 35 U.S.C. 103(a) as being obvious over Mitchell et al in view of Vijayendran et al. The balance of the claims were rejected in view of references which are now apparently withdrawn. There are no reasons of record to support the current rejection. The Examiner has provided no reason for now stating that claims 18, 19, 20, 22, 23, 24, 25, 26, 27, 28, 30, 34 and 35 are also obvious under Mitchell and Vijayendran. It is, accordingly, submitted that **claims 18,19, 20, 22, 23, 24, 25, 26, 27, 28, 30, 34 and 35 are allowable.**

The membrane wall, as set forth in independent **claim 16**, is comprised of a urethane/vinyl hybrid polymer which is disclosed in U.S. Patent 5,173,526 to Vijayendran, the secondary reference relied upon by the Examiner to reject the claims of this application. The urethane/vinyl hybrid polymer can be cross-linked with any number of materials including polyaziridine. In this regard, dependent **claims 19, 22, 24, 25, 30, 34 and 35** specifically mention cross-linking with polyaziridine. Vijayendran does not disclose that the urethane/vinyl hybrid polymer can be or should be cross-linked.

The solid, water-soluble chemical composition enclosed in the hollow interior of the capsule, as set forth in dependent **claim 17**, is selected from a variety of materials included in a Markush group. These materials are, thus, included in all claims which depend from **claim 17**. In this regard, dependent **claims 21, 23, 26 and 27** specifically state the particle size of the chemical composition to be in the range of from about 10 to about 60 mesh US Sieve Series which includes sieve openings in the range extending from 0.0097 inches to 0.078 inches. The primary reference relied upon by the Examiner, Mitchell et al (US 5,741,433), discloses that the pellets enclosed by his material have a diameter in the range of from about 0.0313 inches to about to about 3 inches. The Mitchell pellets are very large.

The membrane wall can consist of a first material, the mentioned urethane/vinyl hybrid polymer, and it can consist of the first material in combination with a second material. In the latter case, the combination is referred to as a composite material wherein the first material forms a matrix which supports the second material. The second material is a particulate solid. The second material is different from the first material. The second material is not reactive with, soluble in nor a solvent for the first material or the composition enclosed in the capsule. The particle size of the second material, which is greater than submicron, is an important feature of the invention. There is no reference which discloses or suggests that limitation. Dependent **claim 18,** and those which depend therefrom, is drawn to the composite material. **Accordingly, claims 18, 20, 22, 23, 25, 27, 28, 30 and 34 are drawn to subject matter not disclosed and not suggested by any reference of record.**

The second material is selected from a variety of materials included in a Markush group as set forth in dependent **claim 20.** One specific second material is silica as set forth in dependent **claim 28.**

Mitchell does not disclose or suggest "a polyurethane-vinyl polymer dispersion" and, accordingly, cannot suggest that a polyurethane-vinyl polymer dispersion is useful as a film former having controlled release properties. (Mitchell, col. 3, lines 43-45, col. 6, lines 1-5)

In contrast, Applicants claim a hollow capsule which contains a chemical composition, wherein the wall of the capsule is a membrane comprised of a polyurethane-vinyl polymer dispersion. In the invention of Applicants, an aqueous liquid diffuses through the membrane wall to the interior of the capsule, dissolves the chemical composition to form a solution which then diffuses through the membrane wall to thereby release the composition from the interior of the capsule. Applicants discovered this property of a membrane wall made with the polyurethane-vinyl polymer dispersion and realized its utility in a capsule having controlled release properties. Mitchell did not make or suggest that discovery and made no suggestion of the utility.

Mitchell, in Table 2, discloses a variety of specific compositions including at least two which, "were not acceptable coating materials due to the sticky nature of the polymers" and two which, "were found to be non film formers." The two "sticky" polymers were vinyl polymers. One of the "non film formers" was a vinyl polymer. Table 2 of Mitchell also listed two polyurethanes, but no working example is provided, and no comment is made with regard to the utility of a polyurethane as a coating material.

Mitchell makes no suggestion that a combination of the sticky/non film former vinyl with the polyurethane would produce a satisfactory membrane. It is submitted that the factual data actually provided by Mitchell teaches away from such a combination. Mitchell does not suggest "a polyurethane-vinyl polymer dispersion" and it is not reasonable to assert that he does. The negative teaching of Mitchell is clearly indicated by the disclosed sticky nature and lack of utility of some vinyl polymers and the notable absence of any display of enthusiasm for polyurethane.

Mitchell stated, "Any type of coating material conventionally known in the art which provides controlled-release properties may be used in the present invention." (Col. 3, lines 43-45) In this regard, the composition disclosed and claimed by Vijayendran was known in the art on the date that Mitchell et al filed their application. **However, there is no indication in Mitchell or Vijayendran that the composition of Vijayendran on that date was "conventionally known in the art" to be a coating material which provides controlled-release properties.** Mitchell failed to recognize the utility and the Patent Office placed the two patents in two different technical classifications. It was left to Applicants to discover the utility of the composition disclosed by Vijayendran.

Vijayendran discloses a flexible surface made from a urethane/vinyl hybrid polymer dispersion which will protect a substrate such as paper, metals, plastics and wood from solvents, corrodants and abrasives. There is no suggestion in that specific teaching that **the composition of Vijayendran was "conventionally known in the art" to be a coating material which provides controlled-release properties.** Inherent in this teaching is the requirement that water shall not pass through the surface to contact the substrate. Vijayendran does not teach and does not suggest the use of his composition as a membrane wall of a capsule.

It is well accepted in the law of obviousness that a reference must clearly suggest to a person skilled in the art to combine the disclosure of that reference with the disclosure of another in order to fairly suggest the claim of an invention. What is resident in the disclosures of Mitchell and Vijayendran to suggest that a combination of the two would produce the invention claimed herein? Nothing. The teaching is contained in the disclosure of Applicants. That teaching cannot be employed by the Examiner in hindsight.

What do Mitchell et al desire?

A membrane wall which will permit water to pass through it from the exterior into the interior of the capsule, and through it from the interior to the exterior of the capsule.

What do Vijayendran et al desire?

A flexible surface which will protect a substrate, such as paper, metals, plastics, and wood, from solvents, corrodants and abrasives. Inherent in this desire is a requirement that water shall not pass through the surface to thereby contact the substrate.

What is the novel aspect of Mitchell et al?

Based upon the content of claim 1, it is clear that the only novel aspect of Mitchell et al is a polymeric coating material for a capsule, "comprising terpolymers containing vinyl acetate, vinyl versatate, and alkyl(meth)acrylate monomer subunits."

What do Mitchell et al fail to disclose?

A membrane wall comprised of a urethane/acrylic hybrid polymer.

Crosslinking anything.

Anticoalescents.

What do Vijayendran et al fail to disclose?

The use of a urethane/acrylic hybrid polymer as a membrane wall of a capsule.

Given the above, what is the reason to combine Mitchell and Vijayendran? The two patents solve different problems. The two patents employ different chemistry to solve the different problems. What is disclosed in Mitchell to suggest to a person skilled in the capsule art to combine Mitchell and Vijayendran to obtain a capsule? Similarly, what is disclosed in Vijayendran to suggest to a person skilled in the capsule art to combine Mitchell and Vijayendran to obtain a capsule which will permit water to pass through its wall from the exterior into the interior, and through the wall from the interior to the exterior? Vijayendran disclose a urethane/vinyl hybrid polymer to protect what is plainly a planar substrate, such as paper, from a solvent. There is no suggestion in Vijayendran that water will diffuse through a film made with that polymer. Mitchell and Vijayendran are in different classes of art. The only connection between Mitchell and Vijayendran is found in the disclosure of this invention.

THERE IS NO REASON TO COMBINE MITCHELL AND VIJAYENDRAN. THE EXAMINER HAS IMPROPERLY EMPLOYED THE DISCLOSURE OF THIS INVENTION AS A GUIDE TO REJECT THE CLAIMS OF THIS INVENTION. THE REJECTION IS FATALLY FLAWED AND SHOULD BE WITHDRAWN.

Specific Response to Comments of Examiner

Contrary to the assertions of the Examiner, the sticky polymer disclosed by Mitchell is not the polymer disclosed by Vijayendran.

That the polymer of Vijayendran can be employed as claimed herein does not "flow naturally" from the disclosure that the polymer forms a flexible surface which will protect a substrate, such as paper, metals, plastics, and wood, from solvents, corrodants and abrasives.

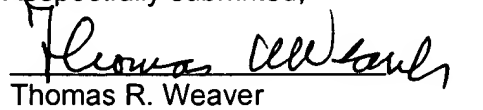
The Examiner has completely misread the disclosures of Vijayendran and applicants. Neither disclosure says anything about the permeability of the polymer itself. Vijayendran talks about a coating which is applied by "conventional flexographic or gravure methods." Applicants talk about a film made by a fluidized bed process. The techniques are different. One produces a coating which obviously resists diffusion. The other produces a film featuring a coating which is not continuous. The film has imperfections and, therefore, does not resist diffusion. In this regard claim 1 talks about a membrane which is permeable. There is nothing in the claim which says anything at all about the permeability of the material itself.

The "good balance" argument asserted by the Examiner is **specious**. Vijayendran did state that his coating has good balance. That statement cannot be interpreted to mean that Vijayendran deliberately placed defects in his continuous coating. Such defects would certainly defeat the purpose of his protective coating. If Vijahendran had really intended to manufacture his protective coating in such a way as to compromise the integrity of the coating, then he would have been explicit. Remember, Vijahendran specifically disclosed a coating which is applied by "conventional flexographic or gravure methods." He said nothing about modifying the coating or the method of making it.

There is nothing in the art that specifically teaches that a protective coating, such as taught by Vijayendran, also permits diffusion. If there is, then the Examiner has not cited it.

This application is in condition for allowance. Reconsideration and allowance is requested.

Respectfully submitted,



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CERTIFICATE OF MAILING

I hereby certify that the within and foregoing document, together with the attachments referred to therein, if any, is being deposited by the undersigned with the United States Postal Service as first class mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on the date written just below my signature.

Thomas R. Weaver
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November 5, 2003
Date

ENCLOSURE A

CLAIM PATTERN